

State of Washington

**Volunteer Firefighters' Relief
and Pension Fund
Actuarial Valuation**

As of December 31, 2002

Table of Contents

Section	Page
I. Summary & Highlights	1
II. Analysis of the Valuation	4
III. Actuarial Determinations	13
IV. System Assets	18
V. Membership Data	21

Appendix

A. Actuarial Assumptions	26
B. Actuarial Methods	29
C. Provisions of the System	31
D. Glossary	34
E. Emergency Medical Service Districts and Reserve Law Enforcement Officers	36



WASHINGTON STATE LEGISLATURE
Office of the State Actuary

**Report of the Actuarial Valuation of the
Volunteer Firefighters' Relief and Pension Fund
As of December 31, 2002**

This report represents the results of the actuarial valuation of the assets and liabilities of the Volunteer Firefighters' Relief and Pension Fund of Washington as of December 31, 2002. The valuation was prepared in accordance with RCW 41.24.320.

Member and beneficiary data were provided by the Board of Volunteer Firefighters. Comparisons were made of the current to prior year's data. Additionally, a series of data edits were performed. The data are sufficient and reliable for the purposes of this valuation. Unaudited asset information was provided by the State Investment Board and the State Treasurer.

The investment return assumption used in this valuation was adopted in 2001.

Demographic assumptions were developed by the Office of the State Actuary. The assumptions are developed from actual experience. An experience study of retirement and termination is performed annually. Where there are insufficient data for an experience study, we use our best estimate of the expected future experience. The assumptions are reasonable and represent the expected future experience.

The valuation includes all benefits that were in effect on the valuation date plus the Laws of 2003.

This report was prepared in accordance with recognized actuarial practices and the procedures consistent with the recommendations of the American Academy of Actuaries.

Sincerely,

A handwritten signature in black ink that reads "Larry Risch".

Larry Risch, ASA, MAAA
Deputy State Actuary

A handwritten signature in black ink that reads "Evan Sent".

Evan Sent
Assistant Actuary

2420 Bristol Court S.W., Suite 101
P.O. Box 40914
Olympia, WA 98504-0914
(360) 753-9144

FAX: (360) 586-8135
TDD: 1-800-635-9993

E-MAIL: actuary_st@leg.wa.gov

Section I

Summary & Highlights

Summary & Highlights

The purpose of an actuarial valuation is to:

- ✓ Develop *contribution rates* which are adequate to support the benefits of the system, as prescribed in statute;
- ✓ Measure the *funding progress* of the system;
- ✓ Compare experience with assumptions used;
- ✓ Detect significant demographic changes;
- ✓ Highlight significant plan changes; and
- ✓ Highlight significant assumption changes.

Contribution Rates:

Valuation	Per Person Contribution Rates	
	2001	2002
Pension Rate		
Employee	\$ 30	\$ 30
Employer	\$ 30	\$ 30
State	<u>\$ (197)</u>	<u>\$ (51)</u>
Pension Rate	\$(137)	\$ 9
Relief Rate		
Employer	\$ 10	\$ 10
State	<u>\$ 80</u>	<u>\$ 74</u>
Relief Rate	\$ 90	\$ 84
Operating Expenses		
Administration and Expenses*	\$ 15	\$ 20

*Estimated using actual dollars

The \$9 per person pension rate for 2002 is the normal cost rate of \$130 plus the unfunded actuarial accrued liability/(surplus) rate of (\$121). The pension contribution rates developed in this report have increased compared to the prior valuation. This is mainly due to the benefit improvements and the lower than expected return on assets.

The relief contribution rate is based on actual annual costs. The rate decreased slightly from \$90 to \$84.

Pension costs are allocated to pension members; relief costs and operating expenses are allocated to all members.

Measurement of Funding Progress:

We have used the *Funding Ratio* as a measure of funding progress. The *Funding Ratio* is the percentage of benefits earned to date which are covered by the actuarial value of assets. The funding ratio decreased from 142% as of December 31, 2001 to 122% as of December 31, 2002.

Comparison of Experience to Assumption:

- ✓ *Investment Return* on the Actuarial Value of Assets was -1.6%, compared to the 8.0% assumption.
- ✓ *Investment Return* on the Market Value of Assets was -5.8%.
- ✓ *Retirements* were 8% above expected (79 compared to the 73 expected).
- ✓ *Terminations* were 27% above expected (1,560 compared to the 1,225 expected).

Significant Demographic Changes:

- ✓ The number of *active members* covered by the pension plan decreased by 93 (-0.8%).
- ✓ The number of *active members* covered by the relief plan increased by 751 (+4.2%).
- ✓ Total number of *retirees* increased by 111 (+4.0%).
- ✓ Total *annual pension benefits* increased by \$191,384 (+3.5%), from \$5,447,939 to \$5,639,323.

Distribution of Membership Between 2001 and 2002		
	2001	2002
Number of Active Members in Relief Plan	17,794	18,545
Number of Active Members in Pension Plan*	11,996	11,903
Percent of Volunteers Covered by Pension Plan	67%	64%
Average Age	40.9	41.0
Average Years of Service	10.1	10.1
Number of Retirees/Beneficiaries	2,743	2,854
Number of Terminated Vested	4,210	4,389
Number of Survivors (Line of Duty)	14	14
Number of Disabilities	14	15

*Includes 26 Emergency Medical Technicians and 244 Reserve Law Enforcement Officers in 2002.

Significant Plan Changes

Chapter 62, Laws of 2003 became effective July 1, 2003.

The pension accrual formula was improved by \$20. This is an increase in accrued benefits of 7% with 25 years of benefit service, and 15% with 10 years of benefit service.

The present value of fully projected benefits increased by \$9 million (+8%).

The entry age normal cost increased \$0.1 million.

The Unfunded Actuarial Accrued Liability contribution rate increased by \$0.9 million.

Significant Assumption Changes

There were no assumption changes since the prior valuation.

Section II

Analysis of the Valuation

Analysis of the Valuation

- ✓ Funding Progress
- ✓ Contribution Levels
- ✓ Economic Experience
- ✓ Demographic Changes in Membership
- ✓ Demographic Experience

Funding Progress

Funding Ratio:

There are various ways of measuring funding progress or funding status. We use a measure of funding status called the Funding Ratio. A Funding Ratio is the ratio of assets to liabilities on the valuation date.

Funding Ratios, when developed on a comparable basis, serve two important functions. They promote comparison between retirement systems and, in time sequence, are valuable as a trend indicator of funding progress or lack thereof.

At present the Volunteer Firefighters' Relief and Pension Fund is fully funded. The funding ratio is 122%. The Funding Ratio itself has no part in the calculation of the required contribution. It is strictly an independent measuring device to promote analysis of funding progress and comparison to other retirement systems.

Calculation of Funding Ratios:

The Funding Ratio is calculated as the ratio of *asset value* to the *present value of credited projected benefits* as of the valuation date. The methods used to determine these items are as follows:

- ✓ *Asset Value* - For this purpose, asset values used are the Actuarial Value of Assets described in Appendix B and developed in Section IV.
- ✓ *Present Value of Credited Projected Benefits* - Benefits are projected to retirement, including future service, but prorated by only that service earned to date.

**COMPONENTS OF THE PRESENT VALUE
OF CREDITED PROJECTED BENEFITS AND
THE PERCENTAGE OF EACH COVERED BY ASSETS**

(Dollars in Thousands)

	Credited Projected Liabilities***			Asset Value	Portion of Liability Covered by Assets			Funding Ratio
	Employee	Retiree	Employer		(1)	(2)	(3)	
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
2002**	\$4,709	\$67,765	\$28,782	\$123,618	100%	100%	178%	122%
2001*	4,668	60,451	25,858	128,799	100%	100%	246%	142%
2000*	4,658	57,122	25,933	126,332	100%	100%	249%	144%
1999	4,616	55,998	28,260	117,622	100%	100%	202%	132%
1998**	4,158	52,940	28,084	102,434	100%	100%	161%	120%
1997	4,055	39,439	19,750	90,835	100%	100%	240%	144%
1996	3,092	37,398	20,365	78,165	100%	100%	185%	129%
1995*	3,063	35,493	19,980	69,065	100%	100%	153%	118%
1994	3,029	32,723	19,071	61,576	100%	100%	135%	112%
1993*	3,029	30,542	21,099	59,360	100%	100%	121%	114%
1992	2,068	28,431	19,848	54,285	100%	100%	120%	108%
1991**	1,882	26,477	19,367	49,114	100%	100%	107%	103%
1990	1,830	21,734	16,940	45,102	100%	100%	127%	111%
1989*	1,800	20,448	16,217	43,104	100%	100%	129%	112%
1988	1,700	20,374	17,856	38,504	100%	100%	92%	96%

*Actuarial assumptions changed.

**Includes the effect of benefit increases.

*** (1) Active employee accumulated contributions.

(2) Retired (and terminated vested) liability - employee and employer financed.

(3) Employer financed portion of active credited projected liability.

Funding Progress:

Section III of this report examines the development of the Funding Ratio for 2002. The Present Value of Credited Projected Benefits (the cost of that portion of a projected pension attributed to service to date) is \$101,256,000. If the level of the Funding Ratio were about 100%, we would have approximately that amount of money in our investment fund to cover these benefits. But assets exceeded that level. As of December 31, 2002, the Actuarial Value of Assets were \$123,618,000. The ratio of the two, or the Funding Ratio, is 122%. The difference is a surplus of \$22,362,000.

Contribution Levels

The method used to determine the contribution as a level dollar amount (Entry Age Cost Method -- see Appendix B) divides the contribution into two parts: Normal Cost and Unfunded Actuarial Accrued Liability Cost. The sum of these two should satisfy all of the liabilities of the system if: the contributions are made regularly; benefits are not increased; and assumptions prove reasonable. Because one source of plan revenue is erratic (the premium tax on fire insurance policies), it is unlikely that we will see a smooth pattern of contributions.

The per person pension contributions are:

Per Person Pension Contribution Rates		
Valuation	2001	2002
Normal Cost		
Employee	\$ 30.00	\$ 30.00
Employer	30.00	30.00
State	58.85	69.58
Normal Cost Rate	\$ 118.85	\$ 129.58
Unfunded Actuarial Accrued Liability Rate		
State UAAL Rate	\$ (255.66)	\$ (120.97)
Total Pension Rate	\$ (136.81)	\$ 8.61

Economic Experience

Economic assumptions are not as readily analyzed by statistical methods as are demographic assumptions. The experience will reflect the current economic, financial and inflationary environment.

- ✓ *Investment Returns* - The actual dollar-weighted rate of return for the year was -1.6% based on the Actuarial Value of Assets. We had assumed a rate of 8.0% for this period. The return based on Market Value, as reported by the State Investment Board, was -5.8%. The investment return assumption is the rate of return we expect to earn over the long term. Significant variations of investment earnings from those assumed should be expected over a short period. The funding of pensions is a long-term proposition and deviations from assumptions over a short time do not necessarily affect long-term costs. Future investment return is assumed to be 8% per year.
- ✓ *Premium Tax* - 40% of the premium tax paid on fire insurance policies is contributed to the plan. The level has fluctuated because the amount of the contribution is net of amounts paid by insurers to guarantee associations. The 1993 Legislature repealed the offset of insurance companies' contribution to guarantee associations. Some insurance companies pay their assessments in five annual installments. Because of this lag in payments, the "Net Premiums" will approach but may not exactly equal the "Gross Premiums" for a few more years.

Premium Tax (40%)			
Fiscal Year	Gross Premium Tax	Assessment Credits	Net Premium Tax
2002	\$ 3,605,541	\$ 620	\$ 3,604,921
2001	\$ 3,320,026	\$ 291	\$ 3,319,735
2000	\$ 2,869,387	\$ 393	\$ 2,868,994
1999	\$ 2,705,585	\$ 29	\$ 2,705,556
1998	\$ 2,286,092	\$ 756	\$ 2,285,336
1997	\$ 2,553,181	\$ 14,080	\$ 2,539,101
1996	\$ 2,991,158	\$ 18,166	\$ 2,972,992
1995	\$ 2,379,854	\$ 50,074	\$ 2,329,780
1994	\$ 2,460,676	\$ 91,147	\$ 2,369,529
1993	\$ 2,131,915	\$ 115,837	\$ 2,016,078
1992	\$ 1,852,699	\$ 116,711	\$ 1,735,988
1991	\$ 2,246,233	\$ 165,584	\$ 2,080,649
1990	\$ 2,040,938	\$ 149,266	\$ 1,891,672
1989	\$ 2,026,826	\$ 126,878	\$ 1,899,948

**Gross Premium Tax - Assessment Credits = Net Premium Tax*

Demographic Changes in Membership

One major factor in any analysis of valuation results is the extent to which the size and composition of the group of covered employees has changed. A comparison of significant characteristics of the covered group as of December 31, 2002 to that as of December 31, 2001 follows. These demographics do not reflect the benefit improvements that were granted under Chapter 62, Laws of 2003.

Actives:

- ✓ The total number of active members covered for relief benefits increased from 17,794 to 18,545 (+4.2%).
- ✓ The total number of active members covered for a pension benefit decreased from 11,996 to 11,903 (-0.8%).
- ✓ The average attained age for active members increased from 40.9 years to 41.0 years.
- ✓ Average service for active members remained the same at 10.1 years.
- ✓ Average benefit service for active members remained the same at 8.8 years.

Retirees:

- ✓ The number of retirees increased from 2,743 to 2,854; an increase of 4.0%.
- ✓ The average monthly benefit payable decreased from \$166 to \$165.

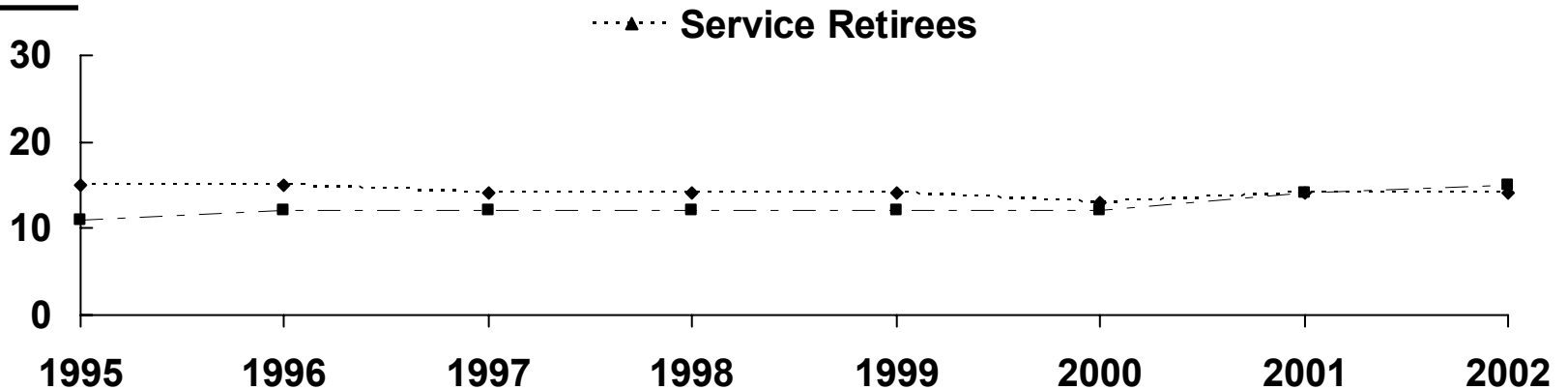
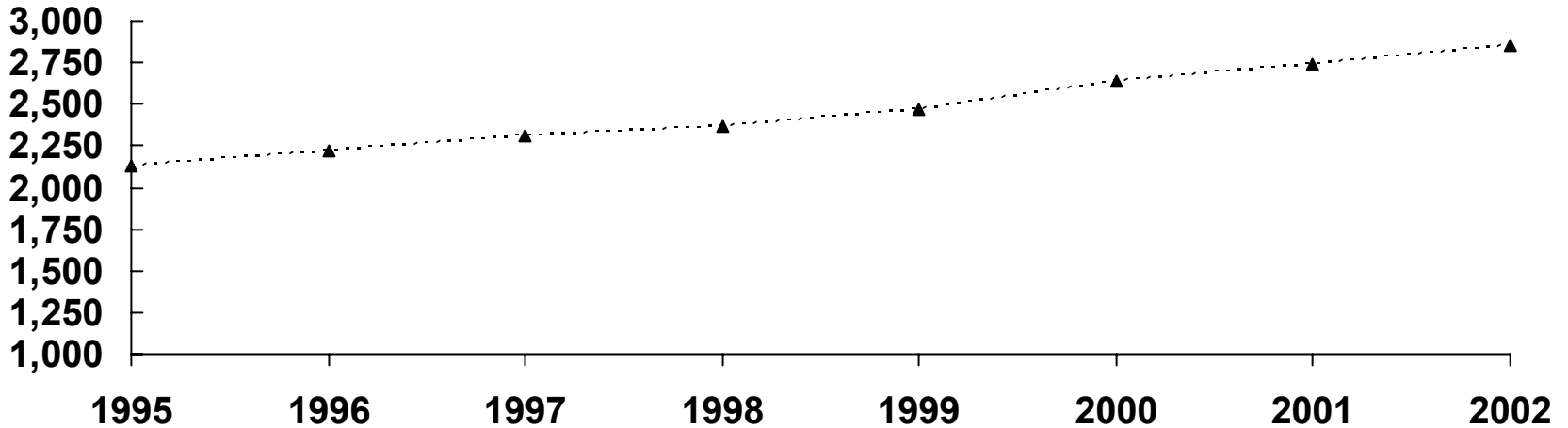
Demographic Experience

	<u>Actual</u>	<u>Expected</u>	<u>Extra</u>	<u>Extra %</u>
Retirements	79	73	6	8%
Retirement Rate	0.7%	0.6%	0.1%	
Terminations	1,560	1,225	335	27%
Termination Rate	13.0%	10.2%	2.8%	

Washington State

Volunteer Firefighters' Relief and Pension Plan

Number of People Receiving Benefits at Year End



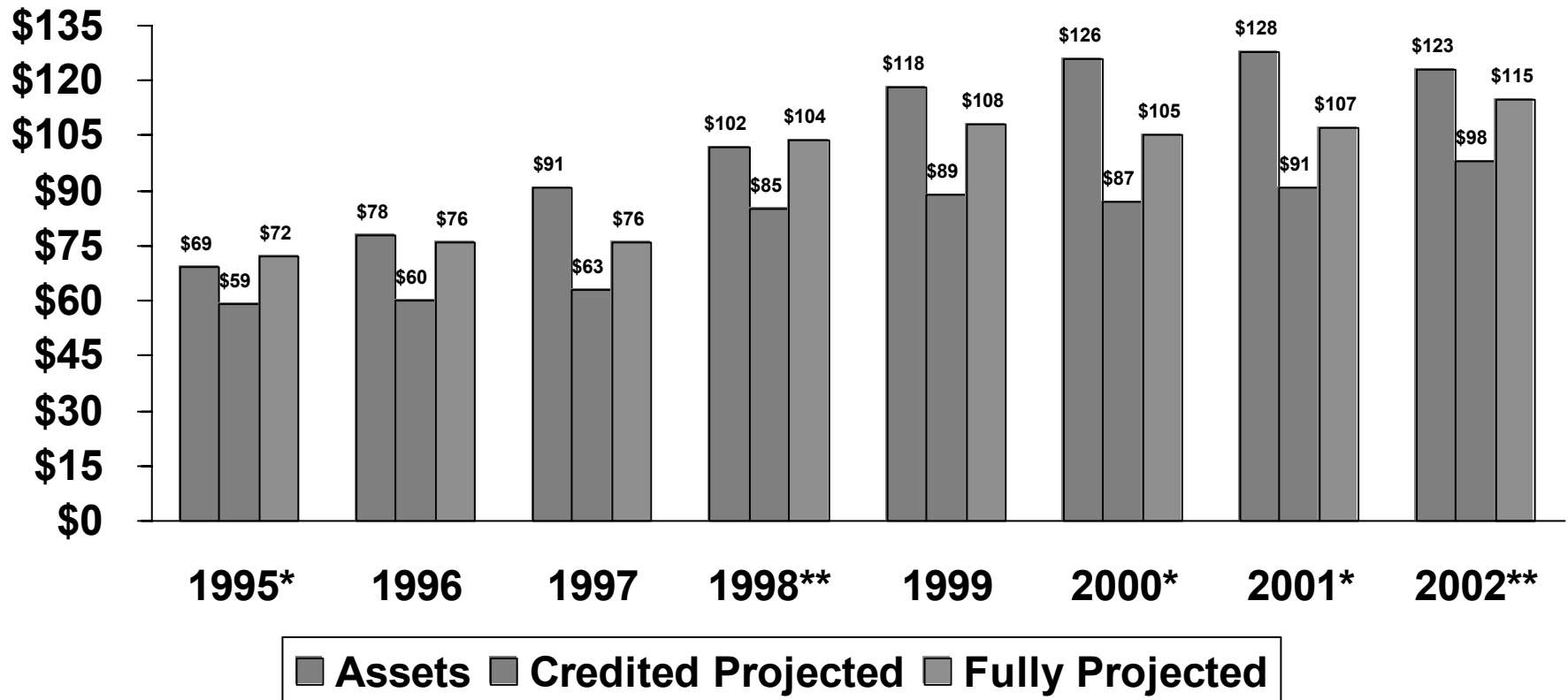
*Relief Benefits

·····▲····· Survivors* —■— Disabilities*

Washington State

Volunteer Firefighters' Pension Plan

Value of Benefits Versus Assets at Year End



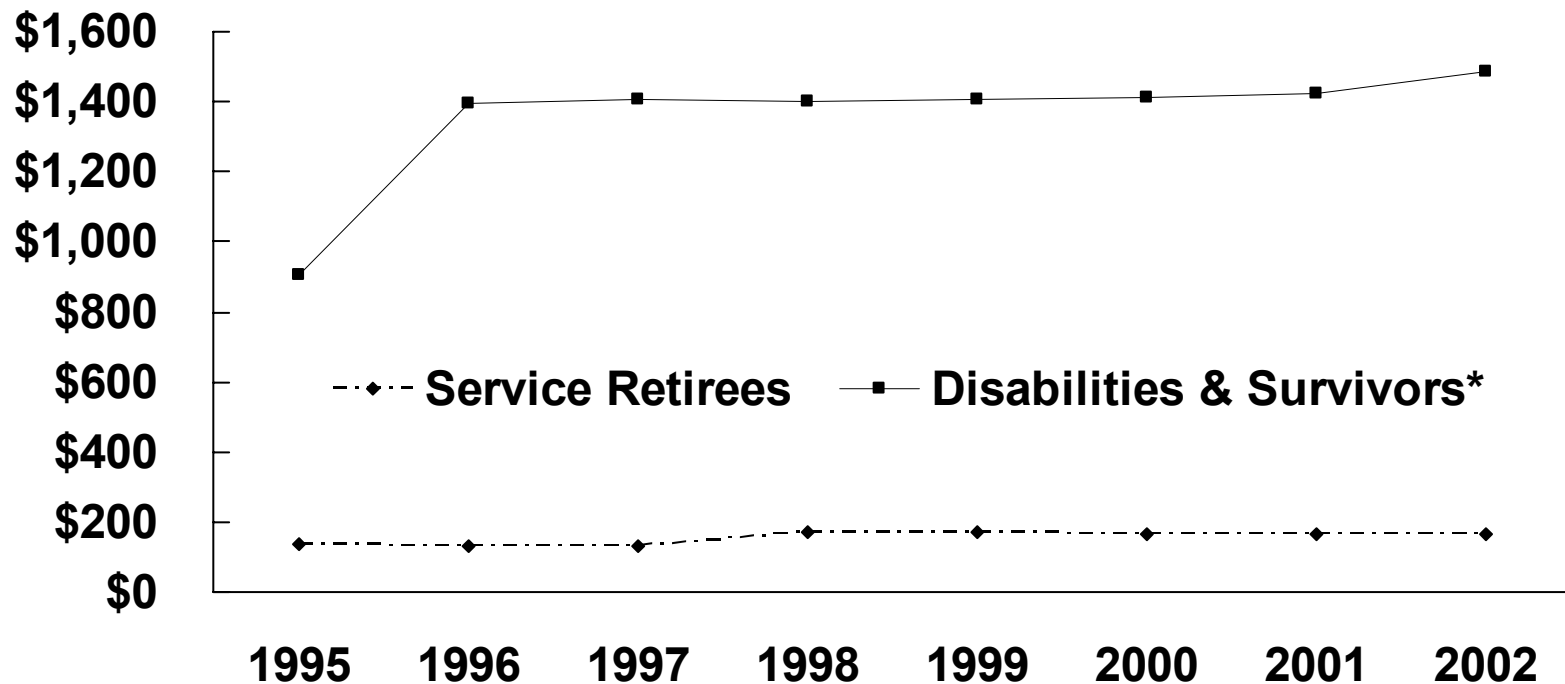
* Actuarial assumptions changed

** Benefits increased

Washington State

Volunteer Firefighters' Relief and Pension Plan

Average Monthly Benefit Payable at Year End

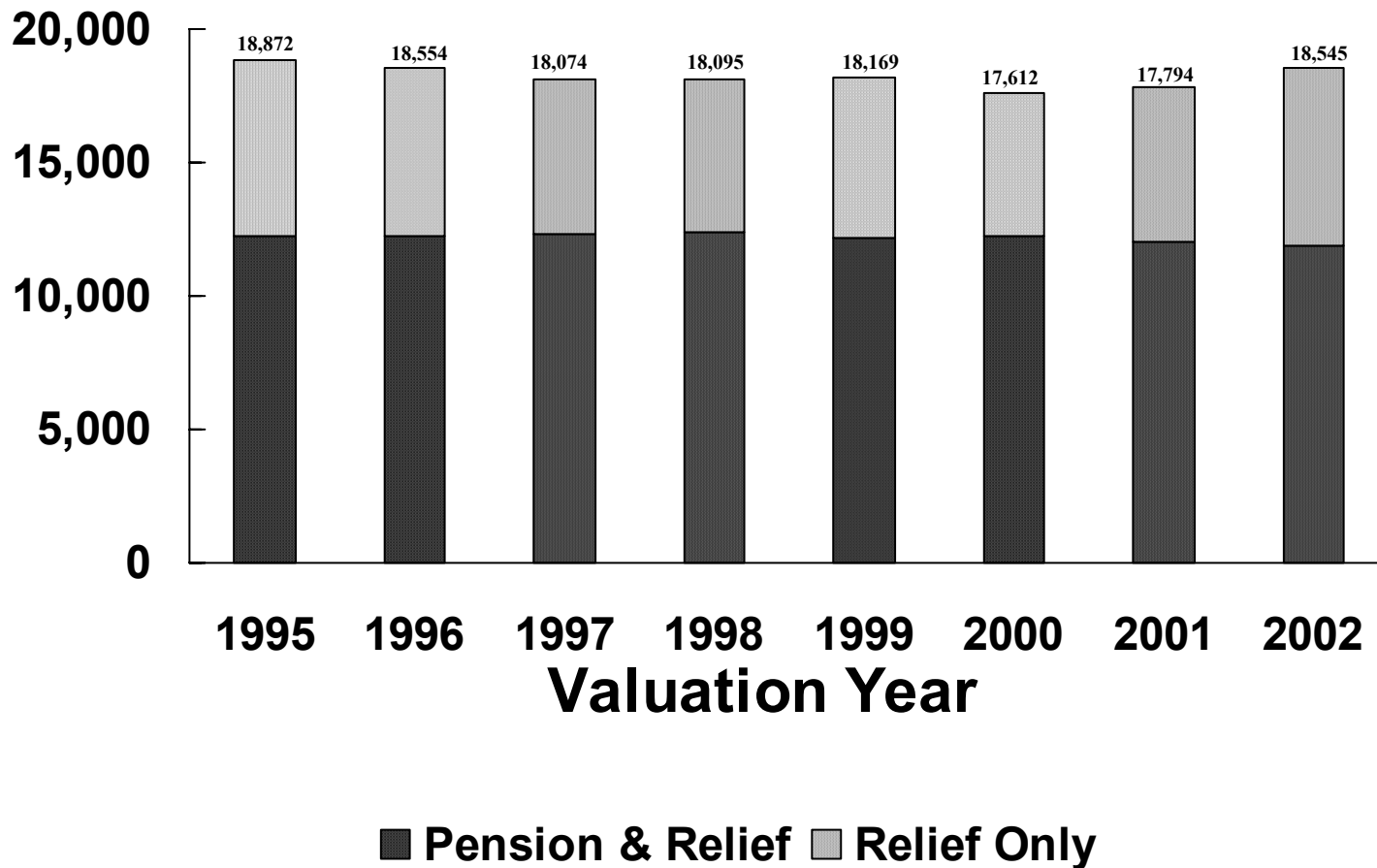


*Relief Plan

Washington State

Volunteer Firefighters' Relief and Pension Plan

Number of Active Members at Year End



Section III

Actuarial Determinations

Actuarial Determinations

Table 1
 Volunteer Firefighters' Relief and Pension Plan
Development of Required Annual Contributions
December 31, 2002

Pension and Relief Plans		
	Per Person	Total
Required Annual Contributions	(Dollars)	(\$ in thousands)
Pension Benefits		
Normal Cost	\$ 129.58	\$ 1,542
Cost of Unfunded Actuarial Accrued Liability <i>(Surplus)</i>	(120.97)	(1,440)
Total Pension Contribution Rate	\$ 8.61	\$ 102
Relief Benefits <i>(Disability, Medical, and Survivor Benefits)</i>		
Temporary or Partial Disability	\$ 24.05	\$ 446
Medical Costs	45.71	848
Survivors	14.47	268
Total Relief Rate	\$ 84.23	\$ 1,562
Total Pension and Relief	\$ 92.84	\$ 1,665
Operating Expense		
Administration and Expenses*	\$ 19.95	\$ 370
Total for Pension, Relief, and Expenses		\$ 2,035

*Estimated using actual dollars.

Note: Totals may not agree due to rounding.

Pension costs are allocated to pension members; relief and operating costs are allocated to all members.

Emergency medical service districts and reserve law enforcement officers pay the full cost, including administration.

Employers pay 1.5% of salary for full paid firefighters not in LEOFF.

Table 2
Volunteer Firefighters' Pension Plan
Development of Unfunded Actuarial Accrued Liability (Surplus)
(Dollars in Thousands)
December 31, 2002

Pension Plan	<u>Total</u>
a. Present Value of Fully Projected Benefits	\$ 118,309
b. Actuarial Value of Assets	\$ 123,618
c. Unfunded Present Value of Fully Projected Benefits (a-b)	\$ (5,309)
d. Present Value of Future Normal Costs	
Employer	\$ 1,921
Employee	\$ 1,921
State	\$ 4,160
	<u>\$ 8,002</u>
e. Unfunded Actuarial Accrued Liability (Surplus) (c-d)	\$ (13,311)
f. Contribution to Amortize the Unfunded Actuarial Accrued Liability (Surplus) by 12/31/2017	\$ (1,440)

Note: Totals may not agree due to rounding.

Table 3
Volunteer Firefighters' Relief and Pension Plan
Comparison of Annual Plan Costs and Income
(Dollars in Thousands)
December 31, 2002

Pension and Relief Plans	
Pension and Relief Plans	<u>Total</u>
Actuarial Costs:	
Normal Cost	\$ 1,542
UAAL (Surplus) to 12/31/2017	(1,440)
Pension	\$ 102
Relief ¹	\$ 1,562
Total Actuarial Costs	\$ 1,665
Income:	
Fire Insurance Premium Tax ¹	\$ 3,605
Administration and Expenses ¹	\$ (370)
	\$ 3,235
Pension:	
Employer	\$ 357
Employee	\$ 357
Other Pension ²	\$ 16
	\$ 730
Relief:	
Employer	\$ 185
Other Relief ^{2,3}	\$ 31
	\$ 217
Total Income	\$ 4,182
Surplus (deficit) Income	\$ 2,517

Note: Totals may not agree due to rounding.

¹ Estimated using actual dollars

² Emergency Medical Services Districts and Reserve Law Enforcement Officers pay full cost.

³ Employer pays 1.5% of salary for full paid firefighters not in LEOFF.

Table 4
Volunteer Firefighters' Pension Plan
Development of Funding Ratio
(Dollars in Millions)
December 31, 2002

Pension Plan	Actuarial Value of Assets	Market Value of Assets
Present Value of Credited Projected Benefits	\$ 101.3	\$ 101.3
Assets	\$ 123.6	\$ 102.9
Unfunded(Surplus)	\$ (22.4)	\$ (1.6)
Funding Ratio:		
December 31, 2002**	122%	102%
December 31, 2001*	142%	124%
December 31, 2000*	144%	139%
December 31, 1999	132%	140%
December 31, 1998**	120%	126%
December 31, 1997	144%	152%
December 31, 1996	129%	136%
December 31, 1995*	118%	125%
December 31, 1994	112%	109%
December 31, 1993*	114%	116%
December 31, 1992	108%	111%
December 31, 1991**	103%	110%
December 31, 1990	111%	114%
December 31, 1989*	112%	114%
December 31, 1988	98%	96%

* Actuarial assumptions changed.

** Benefits were increased.

Table 5
Volunteer Firefighters' Pension Plan
Present Value of Pension Benefits
(Dollars in Millions)
December 31, 2002

Pension and Relief Plans		
Present Value of Benefits	Credited Projected	Fully Projected
Active Members		
Retirement	\$ 19.5	\$ 29.7
Vesting	13.8	20.6
Withdrawal	0.1	0.3
Total Actives	\$ 33.5	\$ 50.5
Inactive Members		
Retirees and Beneficiaries	\$ 44.7	\$ 44.7
Terminated Vested	23.1	23.1
Total Inactives	\$ 67.8	\$ 67.8
2002 Total	\$ 101.3	\$ 118.3
2001 Total	\$ 91.0	\$ 106.9

Note: Totals may not agree due to rounding.

*Includes pension benefits only, not medical, disability, or survivor benefits.

Section IV

System Assets

System Assets

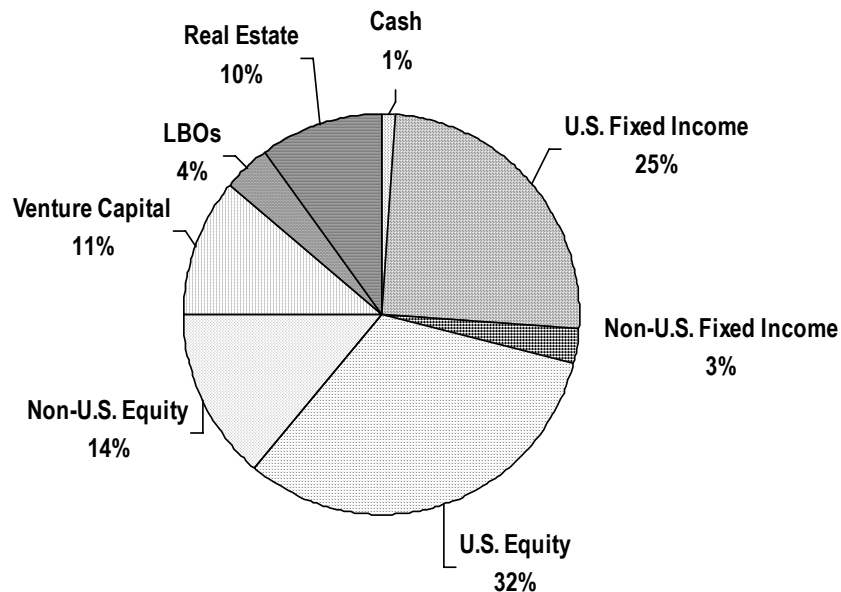
Table 6
 Volunteer Firefighters' Relief and Pension Plan
Market Value and Actuarial Value of Assets
(Dollars in Thousands)
December 31, 2002

Assets as of December 31, 2002	
State Investment Board	\$ 94,280
State Treasury	8,627
Invested Assets	\$ 102,907
Accounts Payable	(5)
(a) Market Value of Assets	<u>\$ 102,902</u>
2002 Deferred Investment Gains (Losses)	\$ (10,598)
2001 Deferred Investment Gains (Losses)	(7,936)
2000 Deferred Investment Gains (Losses)	(2,181)
(b) Deferred Investment Gains (Losses)	<u>\$ (20,716)</u>
(c) Actuarial Value of Assets (a-b)	<u>\$ 123,618</u>
(d) Ratio of Actuarial to Market (a/b)	<u>120%</u>

Note: Totals may not agree due to rounding.

Assets as of December 31, 2001	
(a) Market Value of Assets	\$ 112,532
(b) Deferred Investment Gains (Losses)	\$ (16,267)
(c) Actuarial Value of Assets	\$ 128,799
(d) Ratio of Actuarial to Market	114%

Allocation of Assets as of December 31, 2002*



*State Investment Board

Cash: Money held while being transferred between investments or placed temporarily in an interest-bearing account.

U.S. Fixed Income: U.S. Treasury and government bonds; investment-grade corporate bonds; publicly traded mortgage-backed securities; mortgages; asset-backed and convertible securities.

Non-U.S. Fixed Income: Foreign government bonds.

U.S. Equity: Stock in U.S. companies.

Non-U.S. Equity: Stock in foreign companies.

Venture Capital: Equity financing of early expansion and later-stage growth of small businesses.

Leveraged Buy-outs (LBOs): The purchase of all assets or stock in a company using borrowed funds.

Real Estate: Office and retail space; apartments; warehouses; hotels; etc.

Table 7
Volunteer Firefighters' Relief and Pension Plan
Summary of Financial Activity
(Dollars in Thousands)
Calendar Year Ending December 31, 2002

Market Value December 31, 2001	\$ 112,532
Revenue:	
Contributions:	
Member	\$ 162
Employer	560
<i>Total</i>	<u>\$ 723</u>
Disability Fees	217
Investment Earnings Net of Expenses	(6,486)
Miscellaneous	6
Fire Insurance Premium Tax	3,605
Allocation to the Administration Fund*	(334)
<i>Total Revenue</i>	<u>\$ (2,270)</u>
Disbursements:	
Refunds	18
Expenses	79
<i>Subtotal</i>	<u>\$ 97</u>
Benefits:	
Disability and Survivor	\$ 714
Medical	848
Relief Benefits	<u>\$ 1,562</u>
Retirement Pensions (monthly and lump sums)	<u>\$ 5,704</u>
<i>Total Benefits</i>	<u>\$ 7,266</u>
<i>Total Disbursements</i>	<u>\$ 7,363</u>
Payables:	
<i>Change in Accounts Payable</i>	\$ (3)
Market Value December 31, 2002	\$ 102,902

Note: Totals may not agree due to rounding.

* Actual administration costs were \$291 thousand.

Section V

Membership Data

Membership Data

Table 8
Volunteer Firefighters' Relief and Pension Plan
Membership
December 31, 2002

	<u>1995</u>	<u>1996*</u>	<u>1997*</u>	<u>1998*</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
Actives								
Members in either System	N/A	N/A	N/A	18,095	18,169	17,612	17,794	18,545
Members in Relief System	18,872	18,554	18,074	17,909	18,053	17,607	17,794	18,545
Members in Pension System	12,228	12,279	12,330	12,381	12,210	12,254	11,996	11,903
Percent of Volunteers Covered	65%	66%	68%	68%	67%	70%	67%	64%
Average Age	40.5	40.5	40.6	40.7	40.8	40.8	40.9	41.0
Average Pension Benefit Svc	8.4	8.5	8.6	8.7	8.8	8.8	8.8	8.8
Average Total Service	9.7	9.9	9.9	10.0	10.1	10.1	10.1	10.1
Active Emergency Med. Technicians								26
Active Reserve Law Enf. Officer								244
Retirees								
Number of Retirees/Beneficiaries	2,131	2,222	2,307	2,372	2,473	2,638	2,743	2,854
Annual Benefit Payments (,000)	\$ 3,384	\$ 3,520	\$ 3,658	\$ 4,811	\$ 4,999	\$ 5,277	\$ 5,448	\$ 5,639
Average Annual Benefit	\$ 1,588	\$ 1,584	\$ 1,586	\$ 2,029	\$ 2,021	\$ 2,000	\$ 1,986	\$ 1,976
Average Age	71.8	72.0	72.2	72.5	72.6	72.7	72.8	72.8
New Retirees	145	154	149	137	186	227	193	210
Term Vested								
Number of Term Vested	2,763	2,973	3,203	3,398	3,751	3,960	4,210	4,389
Survivor & Disabled								
Number of Survivors	15	15	14	14	14	13	14	14
Member of Disabled	11	12	12	12	12	12	14	15
Average Annual Benefit	\$ 10,855	\$ 16,711	\$ 16,843	\$ 16,793	\$ 16,884	\$ 16,947	\$ 17,086	\$ 17,828

*1996, 1997 and 1998 data have been revised using straight-line interpretation techniques for missing data.

Table 9
Volunteer Firefighters' Pension Plan
Active Members
Distribution by Age and Membership Service
December 31, 2002

Membership Service: (Nearest Year)	Age Group (Nearest Birthday)									Total
	Less than 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60& Over	
1	393	207	201	140	99	60	33	36	11	1,180
2	406	203	189	148	95	86	53	37	27	1,244
3-4	452	340	303	263	228	162	101	70	71	1,990
5-9	134	414	411	434	406	354	200	104	88	2,545
10-14	0	52	221	251	361	364	269	155	112	1,785
15-19	0	0	30	137	248	317	274	150	116	1,272
20-24	0	0	0	19	165	242	235	207	133	1,001
25 +	0	0	0	0	25	122	224	252	263	886
Total	1,385	1,216	1,355	1,392	1,627	1,707	1,389	1,011	821	11,903

Table 10
Volunteer Firefighters' Pension Plan
Active Members
Distribution by Age and Benefit Service
December 31, 2002

Benefit Service: (Nearest Year)	Age Group (Nearest Birthday)									Total
	Less than 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60& Over	
1	535	275	266	199	125	97	64	50	29	1,640
2	378	224	193	141	125	84	62	44	38	1,289
3-4	357	286	268	237	201	173	100	67	71	1,760
5-9	115	394	410	435	435	377	232	137	114	2,649
10-14	0	37	197	267	357	384	274	177	128	1,821
15-19	0	0	21	101	230	301	294	162	123	1,232
20-24	0	0	0	12	147	220	204	197	146	926
25 +	0	0	0	0	7	71	159	177	172	586
Total	1,385	1,216	1,355	1,392	1,627	1,707	1,389	1,011	821	11,903

Table 11
Volunteer Firefighters' Pension Plan
Service Retirees*
December 31, 2002

Age	Number of Retirees	Average Annual Benefit
60	33	\$ 990
61	24	1,464
62	41	1,578
63	75	1,707
64	84	1,810
65	142	1,928
66	187	1,883
67	146	1,885
68	166	1,948
69	145	2,044
70	137	2,114
71	137	1,973
72	151	1,992
73	151	2,056
74	130	2,041
75	149	2,073
76	131	2,145
77	128	1,999
78	121	2,045
79	87	2,084
80	71	2,052
81	94	1,995
82	71	2,138
83	65	1,887
84	25	2,026
85	33	2,101
86	30	1,876
87	27	2,251
88	24	2,035
89	10	2,043
90 +	39	2,073
Total	2,854	\$ 1,976

**Includes
beneficiaries of
service retirees.*

Table 12
Volunteer Firefighters' Relief Plan
Disabilities and Survivors
December 31, 2002

Disabilities		
Age	Number of Lives	Average Annual Benefit
47	1	\$ 19,584
49	2	17,952
50	2	17,952
54	1	19,584
63	1	19,584
65	1	16,320
66	1	16,320
67	1	22,137
68	3	20,296
75	1	19,584
77	1	19,584
Total	15	\$ 19,026

Survivors		
Age	Number of Lives	Average Annual Benefit
27	1	\$ 16,320
45	2	17,728
48	1	16,642
65	1	16,320
66	2	16,320
78	1	16,320
79	1	16,320
83	1	16,320
85	2	16,320
88	1	16,320
91	1	16,320
Total	14	\$ 16,544

Appendix A

Actuarial Assumptions

Actuarial Assumptions

Investment Returns:

We have assumed an annual investment return of 8.0%.

Mortality:

Mortality rates are from the RP 2000 Combined Healthy Mortality Table. See Table 15.

Retirement Rates:

Retirement rates begin at age 60 for active members. The rates are not a smooth function of age but instead has bumps at ages 60, 62, and 65. See Table 14.

Terminated vested members are assumed to retire at age 65.

Termination:

The termination rates are a function of membership service. Termination rates in the first 10 years start at 17% and grade down to 9%. With 10 or more years of service the member is entitled to a deferred retirement pension. There are noticeable bumps at 20 years (when the service retirement factor significantly improves from 35% to 75%) and at 25 years (when maximum benefit levels can first be reached). See Table 13.

Table 13
Volunteer Firefighters' Pension Plan
Termination Rates
December 31, 2002

Probability of Termination	
Years of Membership Service*	Rate
1	17%
2	17%
3	16%
4	15%
5	14%
6	12%
7	11%
8	9%
9	9%
10	9%
11	8%
12	8%
13	6%
14	6%
15	6%
16	5%
17	5%
18	4%
19	4%
20	9%
21	4%
22	4%
23	4%
24	4%
25	19%
26	13%
27 +	8%

**The early retirement factor improves at 10, 15, 20 and 25 years of membership service.*

Table 14
Volunteer Firefighters' Pension Plan
Retirement Rates
December 31, 2002

Probability of Retirement	
Age	Rate
60	6%
61	3%
62	17%
63	9%
64	3%
65	46%
66 +	26%

Table 15
Volunteer Firefighters' Pension Plan
Probabilities of Death
December 31, 2002

RP-2000 Combined Healthy Table		
Age	Male Mortality	Female Mortality
20	0.0345%	0.0191%
25	0.0376%	0.0207%
30	0.0444%	0.0264%
35	0.0773%	0.0475%
40	0.1079%	0.0706%
45	0.1508%	0.1124%
50	0.2138%	0.1676%
55	0.3624%	0.2717%
60	0.6747%	0.5055%
65	1.2737%	0.9706%
70	2.2206%	1.6742%
75	3.7834%	2.8106%
80	6.4368%	4.5879%
85	11.0757%	7.7446%
90	18.3408%	13.1682%
95	26.7491%	19.4509%

Appendix B

Actuarial Methods

Actuarial Methods

Asset Valuation Method:

The actuarial value of assets is calculated under an adjusted market value method by starting with the market value of assets. For subsequent years the actuarial value of assets is determined by adjusting the market value of assets to reflect the difference between the actual investment return and the expected investment return during each of the last 4 years at the rate of 25% per year (annual recognition).

Actuarial Cost Method:

Every actuarial cost method is defined by the manner of development of two items:

- ✓ Normal Cost
- ✓ Unfunded Actuarial Accrued Liability

The contribution rate is developed as the sum of the Normal Cost and an amount to amortize the Unfunded Actuarial Accrued Liability.

The actuarial cost method utilized in the valuation to develop the pension contribution rates for Volunteer Firefighters' is a version of the Entry Age Cost Method. Under this method, the Normal Cost of each type of benefit in the pension system is determined as that contribution rate which, if paid from entry date to retirement date on behalf of the average member of the system, would fully support that benefit for such member.

The Unfunded Actuarial Accrued Liability is the excess of:

- ✓ The Present Value of Fully Projected Benefits over
- ✓ The sum of (a) the Present Value of Future Normal Costs under the System, and (b) the Actuarial Value of Assets.

Such an excess can arise for numerous reasons. While insufficient contributions and unrealistic actuarial assumptions can contribute, the major reason for its development is simply the natural growth of a retirement system. Examples of conditions which give rise to Unfunded Actuarial Accrued Liabilities are:

- ✓ Benefits granted for service prior to establishment of the plan;
- ✓ Retroactive benefit increases or plan liberalizations;
- ✓ Change of actuarial assumptions; and
- ✓ Actual experience under the System significantly at variance with the actuarial assumptions.

The contributions toward the Unfunded Actuarial Accrued Liability have been developed in this valuation as level dollar amounts which will amortize this item by December 31, 2017.

Relief Plan:

Relief costs are included on a pay-as-you-go basis. Last year's actual costs are used to determine this year's contribution rates.

Operating Expenses:

The actual administration and other miscellaneous expenses incurred last year were used to determine the contribution rate this year.

Appendix C

Provisions of the System

Provisions of the System

There are two employee benefits provided to volunteer fire fighters: optional membership in the retirement plan and mandatory death and disability coverage for duty-related injuries. These benefits are part of two distinct plans, authorized by different sections of statute, and should not be confused as one.

The following section summarizes the benefits and contributions established under Chapter 41.24 RCW. This section is meant for purposes of reference, and does not detail the rules and regulations upon which the actuarial calculations are made.

Participation:

RCW 41.24.010 (10):

“Participant” means: (a) For purposes of relief, any reserve officer who is or may become eligible for relief under this chapter or any fire fighter or emergency worker; and (b) for purposes of retirement pension, any fire fighter, emergency worker, or reserve officer who is or may become eligible to receive a benefit of any type under the retirement provisions of this chapter, or whose beneficiary may be eligible to receive any such benefit.

Contributions:

- ✓ *Death and Disability* - The member does not contribute. Municipalities contribute \$10.00 annually on behalf of each member. Also, municipalities contribute 1.5% of the annual salary of full paid firefighters not covered under LEOFF.
- ✓ *Retirement* - If a member chooses to enroll, they contribute \$30.00 annually and the municipality pays \$30.00. Municipalities may pay the entire contribution for the member. Also, 40% of all premium taxes on fire insurance policies are paid into the plan.

Refund of Contributions:

Upon termination, members are entitled to a refund of their contributions without interest. If the member chooses this option, he/she then forfeits any earned pension benefits.

Buying Back Past Service:

If the pension payment is missed in any year following enrollment in the plan, it may be paid at a later date. Interest is levied at a rate of 1% per month.

Medical Benefits (*Relief Plan*):

Physician and hospitalization costs are covered to the extent set out in the RCW's.

Disability Payments (*Relief Plan*):

RCW 41.24.150

- ✓ *Duty Disability* - Members receive payments of \$2,550 per month for up to 6 months, thereafter payments are reduced. Disabled members receive \$1,275 per month, their spouse \$255, and dependant children \$110.
- ✓ Effective July 1, 2001 benefits are increased annually in line with the CPI Urban Wage Earners and Clerical Workers, all items, all cities index.
- ✓ *Non-Duty Disability* - None.

Death Benefits (*Relief Plan*):

RCW 41.24.160

- ✓ *Survivors* - Surviving spouses of active duty deaths shall be paid \$1,275 monthly. An additional \$110 is paid monthly to member's children while they are under 18 years old. The survivor benefits are subject to a maximum of \$2,550 monthly.
- ✓ Effective July 1, 2001 the maximum of \$2,550 is increased annually in line with the CPI Urban Wage Earners and Clerical Workers, all items, all cities index.

RCW 41.24.160

- ✓ *Duty Death* - A lump sum of \$152,000 is made.

RCW 41.24.230

- ✓ *Funeral and Burial Expenses* - A lump sum of \$2,000 is paid for active duty deaths. Members receiving disability benefits at the time of death shall be paid \$500.

Death Benefits:

RCW 41.24.180

- ✓ *Non-duty Death* - If the member had 10 or more years of service, the spouse may elect an annuity instead of a refund of contributions. The annuity is the member's accrued benefit actuarially adjusted to reflect 100% Joint and Survivor pop-up pension and further actuarially reduced to reflect the difference in the number of years between the fire fighter's age at death and age 65.

Retirement Pensions:

RCW 41.24.170

At age 65 and 10 years of Service, the pension is unreduced for age. Early retirement eligibility begins at age 60 with 10 years of Service, with a reduction for age. In either case the pension is reduced for Service less than 25 years.

The monthly pension benefit formula is:

$(\$50 + \$10 \times \text{Benefit Service}) \times (\text{Membership Service Factor}) \times (\text{Age Factor})$.

"Benefit Service" is the number of years the member has made pension contributions.

"Membership Service" is the number of years the member has been a member of the Relief Plan.

The maximum monthly pension benefit is \$300.

Membership Service Factor for Less than 25 Years of Service:

Membership Service	10 to 14	15 to 19	20 to 24	25 or more
Retirement Factor	20%	35%	75%	100%

Age Factor for Retirement Before Age 65:

Age	60	61	62	63	64	65
Retirement Factor	60%	68%	76%	84%	92%	100%

Retirement Options:

RCW 41.24.172

The normal form of benefit is a Single Life pension.

Retirees have the option of selecting a 100% Joint and Survivor Pop-up pension instead. If the member dies first, the pension continues to the spouse, unreduced. If the spouse dies first, the pension pops up to the amount the member would have received under the normal form.

Benefit Improvements:

Chapter 62, Laws of 2003 became effective July 1, 2003. The pension accrual formula was improved by \$20 so the accrued pension increased from \$130 to \$150 (with 10 years of benefit service), and the maximum monthly pension increased from \$280 to \$300.

The threshold for converting small pensions to a lump sum payment was increased from \$25 to \$50 per month.

Appendix D

Glossary

Glossary

Actuarial accrued liability:

Computed differently under different funding methods, the actuarial accrued liability generally represents the portion of the present value of fully projected benefits attributable to service credit that has been earned (or accrued) as of the valuation date.

Actuarial gain or loss:

Experience of the plan, from one year to the next, which differs from that assumed will result in an actuarial gain or loss. For example, an actuarial gain would occur if assets earned 10% for a given year since the assumed interest rate in the valuation is 8%.

Actuarial value of assets:

The value of pension plan investments and other property used by the actuary for the purpose of an actuarial valuation (sometimes referred to as valuation assets). It is common for actuaries to select an actuarial valuation method that smoothes the effects of short-term volatility in the market value of assets.

Normal cost:

Computed differently under different funding methods, the normal cost generally represents the portion of the cost of projected benefits allocated to the current plan year. The employer normal cost is the total normal cost of the plan reduced by employee contributions.

Present value of credited projected benefits:

The actuarial accrued liability computed under the Projected Unit Credit (PUC) funding method.

Present value of fully projected benefits:

Computed by projecting the total future benefit cash flow from the plan, using actuarial assumptions (i.e., probability of death, retirement, salary increases, etc.), and then discounting the cash flow to the valuation date using the valuation interest rate.

Projected Unit Credit (PUC) Funding Method:

The PUC funding method is a standard actuarial funding method. The annual cost of benefits under PUC is comprised of two components:

- Normal cost; plus
- Amortization of the unfunded actuarial accrued liability.

The PUC normal cost is the estimated present value of projected benefits to be earned in the current plan year.

Unfunded actuarial accrued liability:

The excess, if any, of the actuarial accrued liability over the actuarial value of assets. In other words, the present value of benefits earned to date that are not covered by plan assets.

Appendix E

Emergency Medical Service Districts
and
Reserve Law Enforcement Officers

Emergency Medical Service Districts and Reserve Law Enforcement Officers

Emergency Medical Service Districts:

Chapter 331, Laws of 1993 extended the membership provisions of the pension and relief plans to include Emergency Medical Service District (EMSD) Volunteers.

Applicable RCW states that the funding of the EMSD volunteers should be consistent with the most recent actuarial valuation.

The funding of the system includes contributions from the members and their districts at a rate established in statute. The total of these is less than the normal cost. The balance of the normal cost comes from another revenue source, 40% of the state's premium tax on fire insurance policies. Since the premium tax is independent of the number of members, the addition of new members lowers the system's funding. To prevent this, the entire normal cost and administration expenses shall be paid by the EMSDs and their volunteers. Volunteers pay the fixed dollar rate established in statute. The EMSDs pay the fixed dollar rate plus any excess cost.

Reserve Law Enforcement Officers:

Chapter 11, Laws of 1995 extended the membership provisions of the pension plan to include Reserve Law Enforcement Officers. The pension provisions mirrored those of the EMSD's.

Chapter 148, Laws of 1999 extended the membership provisions of the relief plan to include Reserve Law Enforcement Officers. The relief provisions mirrored those of the EMSD's.